John Mansour

Work outside High Energy Physics

A Little Background

- BS – Worcester Polytechnic (1983)
- PhD – University of Rochester
  - E706 Direct Photon Experiment with Professors Ferbel, Slattery and Lobkowicz
- Postdoc #1 University of Rochester (E706)
- Postdoc #2 Michigan State University (CDF)
- Expecting first child early 1995
- Looking at Postdoc #3
- Decided to look outside physics
- Only condition was to find something that still allowed me to do numerical programming!

Job Search circa 1995

- A general lack of understanding of the experience level for someone completing a PhD in HEP.
- Had one recruiter tell me “It’s not like working in the lab. If something goes wrong you can’t just go back and say oh well let’s try again.”

Skills – In industry there are …

- Statisticians – lot's of people with PhDs or Masters degrees in Statistics, Operations Research, Mathematics. We have over 9 in our group alone. Company has many more.
- Computer Scientists – lot's of programmers/software engineers with traditional CS degrees (all levels).
- Business Analysts – people knowledgeable in the vertical of the business. Strong communication skills and understanding of the business.

Skills – What you can offer …

- A MIX OF ALL THREE!
  - Strong Analytics!
  - Strong programming skills!
  - Ability to understand the business and communication internally and externally!
- This combination of skills is unique and is key in driving success (at least for me).

Skills – What you can offer …(cont'd)

- A deep knowledge of Analytics – not just the use but of the methods. Anyone with a math background can call a packaged routine to do a PCA or constrained multivariate regression. What happens when you have packaged routines that won't scale to the size of the problem or perform fast enough to meet SLAs.
- If you understand the techniques and how to efficiently program them you can do it.

Skills – What you can offer …(cont'd)

- Typically people with analytics degrees know and understand the methods but rely on tools like SAS and R to do their analysis.
- A lot of what I do is when these tools can't solve the problem at hand or scale it enough for our production needs.
- Many times we have sped up processes by 10 or 20 times.

Skills

- Programming – C/C++, Java, C#, SQL, Python, OpenMP
- Distributed processing on large data sets – Hadoop
- Analytics – PCA, Linear and non-linear constrained optimization, clustering, bayes, …
  - The Elements of Statistical Learning
    - www.amazon.com/The-Elements-Statistical-Learning-Prediction/dp/0387848576
  - Bayesian Reasoning and Machine Learning
    - www.amazon.com/Bayesian-Reasoning-Machine-Learning-Barber/dp/0521518148/
  - Machine Learning: A Probabilistic Perspective
    - www.amazon.com/Machine-Learning-Probabilistic-Perspective-Computation/dp/0262018020/
  - Pattern Recognition and Machine Learning
    - www.amazon.com/Pattern-Recognition-Learning-Information-Statistics/dp/0387310738/
  - Modern Multivariate Statistical Techniques: Regression, Classification, and Manifold Learning
    - www.amazon.com/Modern-Multivariate-Statistical-Techniques-Classification/dp/0387781889

Success

- Understand what you like to do.
- Understand what you are good at (hopefully it is the same as above).
- Find a place that values that skill.

Industries

- Market research
- Advertising
- Insurance – catastrophe modeling
- Oil/Gas
- Finance

Resume

- Personal contact information
- Objective – tuned to the job
- List of skills
- Organizations
- Experience (list skill for each task

Interviewing

- Dress appropriately – independent of the what you heard the environment is like.
- Know the company, department, manager as well as you could.
- Know why you are there – if you are there just for a job it will show.
- Communicate – conversations require a minimum of two people.

Interviewing (cont'd)

- You are there to answer questions and ASK questions.
- Learn what the environment is like. Is this a place I would really like to work at?
  - What is expected of you in the job?
  - Turnover rate in the group?
  - Organizational structure
  - Resources available
  - How is the group positioned within the company?
- If it is not right for you – move on. Otherwise there is a good chance no-body will be happy in a year.

Interviewing (cont'd)

- Be prepared to talk in detail about anything on your resume. If it is on the resume it is fair game. If you have little or no knowledge about skills listed on your resume it will not go over well.
- "I don't know" is a good answer – be honest. Not everyone is supposed to know everything. (Just don't use it too often).

Interviewing (cont'd)

- Examples
  - Know what you want: I walked out of an interview once when I realized I would not be doing what I like. The interviewer was shocked but I think appreciated not wasting his time.
  - Know why you are there: I once asked someone why he wanted to leave his current job – his response was "Well, I don't want to leave it is a good place". So I asked him why he was interviewing with me – interview did not go well.
  - Be honest: One time a company wanted to hire me to do something I had no experience with. I kept telling no because of that reason – they kept offering me more money.